Caregiver Involvement in a Large Clinical Systems Project

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ABSTRACT

The Kaiser Permanente Northern California Region (KPNCR) CareGiver Workstation (CGW) Project's mission is to develop and implement a clinical workstation system that will enhance each caregiver-member interaction and aid in the decision-making processes of direct patient care in the inpatient and outpatient settings.

The requirements analysis approach for CareGiver Workstation (CGW) is based on the belief that extensive caregiver involvement will provide a better understanding of the diverse needs of Kaiser Permanente Northern California Region (KPNCR). In order to involve as many caregivers as reasonably possible, CGW included a 16 member caregiver core team and 6 different Medical Centers in the requirements definition process. The Medical Centers are referred to as "focus facilities". A "focus group" (caregiver team) at each selected focus facility consisted of a site coordinator and a 24-30 person multidisciplinary team involving physicians, nurses, therapists and other caregivers. The Medical Center selection process identified facilities that provided the best cross-sectional representation of KPNCR.

The Lead Focus Facility participated in the initial round of requirements definition activities. These sessions assisted in the design of a simulation that was used at five additional Medical Centers to validate requirements. The five additional Focus Facilities participated in simulation review sessions. Feedback from these sessions was used to revise the simulation and update the requirements document. Caregivers from all six focus facilities and other identified groups participated in a requirements survey to assist CGW with identification of high priority features.

Caregiver commitment and continuing involvement are essential for the success of CGW. The development of an initial system that can benefit the largest group of caregivers requires extensive user input and evaluation.

INTRODUCTION

The Kaiser Permanente Northern California Region (KPNCR) CareGiver Workstation (CGW) Project's mission is to develop and implement a clinical workstation system that will enhance each caregiver-member interaction and aid in the decision-making processes of direct patient care in the inpatient and outpatient settings. The system is expected to meet the information system needs of a 2.5 million member Health Maintenance Organization (HMO) and the Region's 30,000 caregivers located at 15 hospitals and 32 clinic offices throughout northern California . CGW has defined a caregiver as any person who provides care directly to a patient. Caregivers include physicians, nurses, therapists, etc. CGW is a large-scale development project which embraces the traditional medical informatics concepts of the Electronic Medical Record, Order Entry & Communications, Decision Support, Clinician Data Capture and Data Presentation. This system will have a significant impact on the delivery of patient care throughout KPNCR.

Caregiver and Information Services (IS) expertise are essential for successful system development and implementation. Therefore, the responsibility for the project is shared by caregivers and IS. The project is jointly managed and staffed with caregivers and IS both accountable for the planning, budgeting and caregiver involvement activities.

CAREGIVER INVOLVEMENT

Management Structure

To obtain adequate caregiver involvement a multilayered strategy was implemented. Different caregiver roles and responsibilities were identified and included in the project plan.
 The first layer involves the project's management structure. A full-time Caregiver Manager co-

manages the project with an IS Manager and a Chief Clinician that represents the physician community. The co-management structure provides for the needs of all users to be represented in decisions affecting the project plan. In addition, a caregiver works on the leadership team with specific responsibility to direct the project communication efforts. This individual, the Communication Administrator, coordinates and helps to manage the caregiver involvement strategy.

Caregiver Core Team

The second layer of caregiver involvement is comprised of the Caregiver Core Team. The Caregiver Core Team includes 16 caregivers (5 nurses, 7 physicians, a respiratory therapist, a unit assistant, a medical assistant and a management engineer) from medical centers throughout KPNCR. The Core Team meets once a week to provide input, direction and critique to the clinical systems development process. Issues are often debated by the Core Team and recommendations are forwarded to Project Management. The Core Team serves as the primary source of system requirements and estimates of cost and benefits. In addition, the Core Team provides a caregiver perspective to the vendor evaluation process.

Focus Facility Involvement

The third layer of caregiver involvement includes caregivers from the Medical Centers. Invitations were extended to all Medical Centers in KPNCR to participate as a CGW "focus facility". Each facility administrative team viewed a presentation describing the CGW Project and the focus facility process. The goal of the focus facility selection process was to identify a combination of six facilities that would provide a cross-sectional representation of KPNCR. Although nearly all facilities indicated a desire to be a focus facility, six facilities were selected based on criteria that included geographic location, facility size, specialty services, clinical information systems experience and administrative support. These six medical centers were selected to participate in identification, validation and prioritization of caregiver requirements.

One of the selected medical centers was chosen as the "lead focus facility". The facility identified an administrative nursing sponsor and a physician sponsor to provide administrative support for focus facility activities. In addition to local sponsorship,

the facility also selected a caregiver to function as the facility coordinator. The coordinator works closely with the CGW project team to plan and organize focus facility activities. The facility sponsors and coordinator recruited twenty five caregivers (8 physicians, 8 nurses, 9 others) from the facility to view the early development of requirements simulation software and provide insight for the system analysts. The caregivers included a mix of novice and computer-literate individuals. The caregivers at the facility are responsible for assisting with validation of initial functional requirements, enhancing the system design and providing a "frontline" perspective to the project.

The five additional focus facilities were organized in the same manner as the lead focus facility. Twenty five to thirty caregivers from each facility attended a four hour education session and 4 four-hour sessions to review, validate and prioritize the system's functional requirements. Each of the focus facilities also participated in a 109-question requirements survey to assist in prioritizing system features. The requirements survey was also distributed to selected KPNCR committees and caregiver peer groups.

General Caregiver Involvement

To provide opportunities for involvement of caregivers not associated with the focus facilities, additional activities were organized. Caregivers were interviewed by project analysts to identify issues regarding workflow and data needs. Other caregivers volunteered to be shadowed by an analyst while performing their daily tasks to determine workflow in the "real-life" setting. Presentations were delivered to all interested departments or groups. Individuals interested in the project were added to a contact list for future follow-up. Newsletters, video conferences and a "hot line" were all established to provide contact avenues for the caregiver community.

REQUIREMENTS AND SIMULATION

The primary objectives for Phase II of CGW are to identify the functional requirements of a clinical information system, evaluate the healthcare information systems vendor market, and evaluate the resource requirements associated with custom system development. The caregivers were very involved with identification of the functional requirements. The initial requirements for CGW were developed between June 1993 and January 1994, using the Caregiver Core Team as the primary

contributors. The IS systems analysts, all with clinical experience, also conducted interviews and workflow observations which contributed to the requirements. The analysts compiled this information to create the final requirements draft.

The requirements are a detailed description of the caregiver needs of an information system. After completion of the requirements document it was necessary for it to be reviewed by a larger group of caregivers to validate and add to the requirements. Since it was unreasonable to have a large caregiver audience unfamiliar with information systems terminology review the written requirements, a computerized simulation was built to visually communicate the requirements for evaluation and validation. This simulation system was developed using Visual Basic on PC clones. The platform chosen to develop the simulated system allows for quick creation and modification of computer screens. Initial screens were developed by the user team, analysts and programmers from the requirements document.

Simulated requirements viewed by the lead focus facility: 9/93-12/93

1) Access to clinical data
2) Order Entry & Communications
3) Charting in response to an Order (Vital signs, I/O, etc.)
4) Physical exams and structured forms entry
5) Progress notes and free text entry

Simulated requirements viewed by all focus facilities after initial input and prioritization: 2/94-5/94

1) Access, orders, charting
2) Caregiver specific review of all features

The simulation was reviewed by the user team prior to the presenting it to the focus facility. At the focus facility, the caregivers were organized into two groups of approximately 12 caregivers. One group met in the morning and the other in the afternoon. The simulation session began with a short introduction of the requirements in the simulation that day. The group was then separated into subgroups of six caregivers at a computer terminal. Each caregiver was given the opportunity to be the "mouse driver" and actually operate the simulation. One of the systems analysts facilitated the session by guiding the caregivers through a clinical script from which the

simulation was developed.

The caregivers viewing the simulation were encouraged to provide uninhibited criticism. All comments and suggestions were considered valid. The systems analysts were specifically instructed not to tell the caregivers what the system would do for them, but to ask the caregivers what they want the system to do for them. The analyst asked questions such as "Would this function work for you? Why or why not? What else would you need? What other functions would you need?". The caregiver responses were recorded by scribes and the requirements and simulation were updated based on the information collected.

The simulation represents the caregivers' conceptual view of the assistance a computer system can provide them in accomplishing their complex tasks. The simulation was also used as a communication tool to show other caregivers the eventual uses of a clinical information system.

Table 1. Caregiver numbers and hours

Caregiver Group	Number	Hours
Core Team	17	5848
Focus Facilities	185	3940
Interviews	76	152
Observations	15	60
Presentations	1083	1083
Totals	1376	11083

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SURVEYS

The simulation itself could not provide all the information needed to proceed with developing and prioritizing system features. The development team and the caregivers completed the requirements identification process, but additional input was needed to prioritize system features. A survey was developed to query the caregiver population on the urgency of system features.

A 109-question survey was developed from the requirements document. Questions were divided into 5 categories:

I.   Care Support
     Questions 1-15
II. Viewing Clinical Information
     Questions 16-34
III. Order Entry and Communications
     Questions 35-65
IV. Care Documentation
     Questions 66-109
V.   Demographic information

The survey was designed to determine the importance of certain system features. Each question was rated by the caregiver on a scale from 1 to 5, with 1 "not at all important" and 5 "extremely important". The survey was initially administered to the focus groups and selected committees. Two hundred and one surveys were returned. It was also distributed at presentations to clinical groups and to specific individuals on the project contact list.

Example of high priority survey results: (numbers indicate the mean result for that item)

I.   Care Support
     •Obvious indication for abnormal results not
       viewed (4.55)
     •Simple management of job related tasks (4.53)

II. Viewing Clinical Information
     •Patient medication lists with dates and dosages
       (4.53)
     •Viewing patient lab results (4.48), physician
       notes (4.47), summary problem list (4.46),
       allergies and adverse reactions to medications
       (4.37).

III. Order Entry and Communications
     (types of orders desired)
     •Laboratory (4.64)
     •Pharmacy (4.60)
     •Consults (4.25)
     •Nursing and Diagnostic Imaging (4.12)

IV. Care Documentation (types of documentation)
     •Patient problems and diagnosis (4.63)
     •Document findings from the patient interview
       & examination (4.62)
     •Document medication administration (4.38)

•Documentation devices should be located on the nursing station (4.86), in the physician office (4.77) and in the exam room (4.29)

In addition, the survey validated that having a partial order entry system (e.g. inpatient only), was not desirable and that caregivers would like to have some level functionality immediately, rather than wait for new technology to mature. (Such as voice recognition, pen computing, handwriting recognition, etc.) The survey results also indicated that there were very few differences between physicians, nurses and other caregivers in the placement of the top 3 or 4 items in each section.

The surveys were instrumental in planning the development strategy of the CGW. The results of the surveys were used to divide the features into three "levels". Level I contained the critical features for a useful system and will be pursued first. Level II includes features that will be added after the initial system features are available to all KPNCR. Level III includes all additional features necessary to allow the paper chart to be replaced with an electronic medical record.

Next Steps

The next phases of the project will continue to involve caregivers in all activities. After the completion of the analysis phase and selection of a development approach an initial test Medical Center or "beta site" will be selected. The beta site will focus on reengineering care as well as the technical implementation of CGW. All caregivers at the beta site will be involved in the reengineering efforts and system implementation activities. Analysis of the effect of automation on the beta site will assist the project determine the implementation processes for all of KPNCR.

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